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A Bibliography of Unclassified Literature, Part 3

TO: F. L. Culler

FROM: J. O. Blomeke

ABSTRACT

This bibliography of the unclassified literature on radioactive waste treatment and disposal has been compiled from references published in the Nuclear Science Abstracts, Volume 12, No. 13 (July 15, 1958) through Volume 13, No. 14 (July 31, 1959).

This bibliography brings up to date previous bibliographies published as CF-57-8-118 and CF-58-7-77.

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1.00 GENERAL

1. Radioactive Waste Management at Oak Ridge National Laboratory. F. N. Browder. Report ORNL-2601 (April 17, 1959).
2. "Treatment of Liquid Radioactive Wastes." Conrad P. Straub. Proc. Am. Soc. Civil Engrs. 85, No. SA 1, 61-8(1959) Jan.
3. Reactor Fuel Processing. Technical Progress Review, Vol. 2, No. 1. Lemont, Ill., Argonne National Laboratory, 1959.
A review of the operating experience in waste disposal at various AEC sites is given along with a summary of reported work in specific phases, such as waste volume reduction, reduction of solids, removal of specific isotopes, and final disposal methods.
4. Waste Treatment and Disposal Problems of the Future Nuclear Power Industry. F. R. Bruce. CF-59-1-38. (Jan. 28, 1959).
5. Nature of Radioactive Wastes. F. L. Culler, Jr. CF-59-1-106. (Jan. 26, 1959).
6. Reactor Fuel Processing. Technical Progress Review, Vol. 2, No. 2 Lemont, Ill., Argonne National Laboratory, 1959.
Waste disposal discussions are presented with emphasis on the congressional hearings, operating experience, and final disposal methods.
7. A Radioisotope Training Center at Rehovoth, Israel. M. Ambar (Weizmann Inst. of Science, Rehovoth, Israel). A/CONF.15/P/1616.
A training school in the various applications of radioisotopes was established at the Weizmann Institute of Science, Rehovoth, Israel. Courses for chemists include waste disposal.
8. Disposal of Radioactive Waste. K. Saddington and W. L. Templeton. London, George Newnes Limited, 1958.
Problems associated with the containment and disposal of fission products from power reactors are discussed.
9. "The Processing of Irradiated Nuclear Fuels." E. Pohland. Atomwirtschaft 3, 385-8(1958) Oct. (In German)
A brief survey is made of the processing of irradiated fuels. The separation methods, purification of uranium and plutonium, and the disposal of waste products are considered.
10. Handbook of the Atomic Energy Industry. S. Jefferson. London, George Newnes Limited, (1958).
Information is presented on the atomic energy industry under radicisotopes; use of radioisotopes and their radiations in industry; medical, biological and agricultural uses of radiation and radioactive isotopes, radiation hazards and protection; radiation detectors, handling of radioactive isotopes; and radioactive waste disposal.

11. Report on the Egyptian Atomic Energy Commission for the Year 1957: Its Creation, Programs, and Activities. (1957). AEC-tr-3433.
The status of the development of nuclear technology in Egypt in 1957 is reviewed.
12. Proceedings of the Twelfth Industrial Waste Conference: May 13, 14 and 15, 1957. Extension Series No. 94, Engineering Extension Dept. Lafayette, Ind., Purdue University, (1958).
A subject index is included.
13. "Fission-Product Disposal." K. Saddington. J. Brit. Nuclear Energy Conf. 3, 290-8 (Oct. 1958).
14. Power Auxiliaries and Research Reactors. NP-6829 (Sect. 3). (June 1958).
The problems of disposing of the large amounts of highly-radioactive waste resulting from a large-scale nuclear power program are reviewed.
15. "Radioactive Wastes Resulting from the Peaceful or Military Utilization of Atomic Energy." Claude Paoletti and A. Delaud. Age nucleaire No. 6, 33-43. (Sept-Oct. 1957).
16. "Processing and Disposal of Low-Level Wastes." D. C. Sammon. Progress in Nuclear Energy. Series III. Process Chemistry. Vol. 2.
17. "Ultimate Disposal of Radioactive Wastes." W. A. Rodger and P. Fineman. Progress in Nuclear Energy. Series III. Process Chemistry. Vol. 2.
18. Radioactive Contamination, Decontamination and Waste Disposal: Water Supplies; Liquid Wastes. NP-6925. (July 1958).
Ninety-four selected references are included.
19. "What is Safe Waste Disposal?" Wallace de Laguna. Bull. Atomic Scientists 15, 35-43. (Jan. 1959).
The nature of radioactive wastes and their hazards is considered, and present and future methods of disposal are discussed.
20. "Nuclear Insurance and Standards." R. G. McAllister. Am. Ind. Hyg. Assoc. J. 19, 345-8. (Aug. 1958).
The need for standardization in such aspects of radiation protection as dosimetry and monitoring methods, reporting of surveys, keeping of records, and waste disposal is stressed.
21. "The Disposal of Radioactive Waste Material." Thomas Jaeger. Atomkern-Energie 3, 190-6. (May 1958).
22. "Disposal of Radioactive Wastes." Thomas Jaeger. Atomkern-Energie 3, 273-7. (July 1958). II.
23. The Industrial Problems Raised by the Processing of Radioactive Liquids. Some of the Specific Solutions Applied at Marcoule. C. Bernaud. A/CONF.15/P/1178.
24. Disposal of Liquid Wastes at the Knolls Atomic Power Laboratory. M. M. Cahn, L. L. German, and C. N. Perleberg. KAPL-569. (June 8, 1951).

25. Radioactive Waste Disposal. UCRL-5068. (April 25, 1957).
26. "Handling and Disposal of Radioactive Wastes." John F. Newell. Am. Ind. Hyg. Assoc. J. 19, 31-5. (Feb. 1958).
27. "Design and Construction of a Model Plant for the Purification of Radioactive Wastes (Decontamination)." Ernst Plotze. Atomkern-Energie 3, 186-90. (May 1958).
28. Design Basis for the Fuel Handling and Decay Storage Facility. W. W. Kendall, R. A. MacLeod, and D. D. Peden. AECU-4064. (Nov. 14, 1958).
29. Research and Development Activities in the Field of Radiological Sciences Quarterly Progress Report for April-June 1958. J. W. Healy. HW-56928. (July 28, 1958).
Laboratory investigations were conducted to obtain data for waste disposal studies.
30. Compilation and Analysis of Waste Disposal Information. E. D. Arnold. CF-57-2-20(Del.). (March 12, 1957). Decl. with deletions Mar. 13, 1957
31. The Role of Waste Management in the Development of the Nuclear Energy Industry. Joseph A. Lieberman. A/CONF.15/P/2004.
32. Multipurpose Processing and Ultimate Disposal of Radioactive Wastes. E. G. Struxness and J. O. Blomeke. A/CONF.15/P/1073.
33. Afvalwaterbehandeling. Driemaandelijks vorderingsverslag. P. Dejohghe, L. Baetsle, L. De Witte, G. Mosselmans, H. Spiert, and N. Van de Voorde. NP-7248. (Aug. 11, 1958).
A progress report on the processing of waste solutions at the Centre d'Etude de l'Energie Nucleaire is presented.
34. Radioactive Waste Processing and Disposal: A Bibliography of Selected Report Literature. Hugh E. Voress. Theodore F. Davis, and Thomas N. Hubbard, Jr. TID-3311. (June 1958).
35. Radioactive Waste Treatment and Disposal - A Bibliography of Unclassified Literature. Part 2. J. O. Blomeke. CF-58-7-77. (July 22, 1958).
36. "Radioactive Waste Disposal." A. N. Marei. Priroda 47, No. 12, 47-50. (Dec. 1958).
37. "Disposal of Radioactive Waste on Land." H. H. Hess and W. R. Thurston. Trans. Am. Geophys. Union 39. 467-8. (June 1958).

2.00 RADIOLOGICAL HEALTH AND HAZARDS

38. Radiation Exposure to People in the Environs of a Major Production Atomic Energy Plant. J. W. Healy, B. V. Andersen, H. V. Clukey, and J. K. Soldat. A/CONF.15/P/743.
39. "Surface Contamination Control with Uranium Rolling Operations." Charles D. Blackwell. Am. Ind. Hyg. Assoc. J. 20, (April 1959).
40. Radioactive Contamination from Nuclear Tests and Reactors, with Particular Application to Agriculture and Fisheries. NP-7364. (March 1959).
41. Effects of Uranium Ore Refinery Wastes on Receiving Waters. E. C. Taivoglou, A. F. Bartach, D. E. Rushing, and D. A. Holaday. (1958).
42. "Ecological Studies in Radioactive Waste Disposal Areas." S. I. Auerbach. Proc. of the First Annual Texas Conf. on the Utilization of Atomic Energy. (August 1958).
43. Safe Handling of Isotopes. Vienna, The International Atomic Energy Agency. (1958).
44. Control of Health Hazards in Handling Plutonium. Results of 14 years Experience. H. F. Schulte and D. D. Meyer. A/CONF. 15/P/760.
The problems associated with air cleaning and waste disposal are discussed and practical solutions offered.
45. "Safety Measures in Handling Radioisotopes." V. Slouka. Pracovni lekarstvi, Praha 10. (1958).
46. Radiation Hazards and Protection. D. E. Barnes and Denis Taylor. (1958).
47. Evaluation of Potential Radiation Hazard Resulting from Assumed Release of Radioactive Wastes to Atmosphere from Proposed Buchanan Nuclear Power Plant. Ben Davidson and James Halitsky. NP-7305. (April 1957).
48. Factors Affecting the Dispersal of Fission Products in Estuarine and Inshore Environments. D. W. Pritchard. A/CCNF.15/P/1835.
49. Report of the Joint Program of Studies on the Decontamination of Radioactive Waters. ORNL-2557. (February 11, 1959).
50. Possible Health Hazards Associated with the Laundering of Radioactively Contaminated Protective Clothing. S. G. Pearsall and L. Gemmell and A. Breslin. Health Phys. 1, (September 1958). (176-83)
51. Health and Safety in Canadian Operations. G. C. Butler, G. Cowper, C. A. Mawson, J. Neil, C. G. Stewart, and G. W. C. Tait. A/CONF.15/P/184.

3.00 MONITORING

52. A Continuous River Sampling System and Methods of Radiochemical Analyses for Strontium-89, 90, Barium-140, and Phosphorus-32. W. B. Silker. HW-47578. (January 14, 1957).
53. Radiation Monitoring at the Shippingport Atomic Power Station. F. J. Long. WAPD-T-624(Rev.).
54. Proportional Sampling of Flowing Liquid Wastes for Radioactive Monitoring. John M. Ruddy. BNL-4010. (April 5, 1959).
55. "Plant-Type Polarographic System for Determining Uranium in Radioactive Waste Streams." G. J. Alkire, Karl Koyama, K. J. Hahn, and C. E. Michelson. Anal. Chem. 30, 1912-15 (December 1958).
56. Automatic In-line Analyzers for Radioactive Constituents in Liquid and Gaseous Waste Streams. L. C. Schwendiman, H. G. Rieck, and R. A. Harvey. A/CONF.15/P-394.
57. "Radioactive Fall-out in the Areas Around Leningrad." V. P. Shvedov, V. A. Blinov, et al. Atomnaya Energ. 5, 577-82 (1958).
58. "An-Electrostatic Precipitator for High-Speed Sampling." V. J. Lenger. Chem. listy 50, No. 1, 146-8(1956).

4.00 WASTE TREATMENT

4.10 Origin, Characteristics, and Processes

59. Characteristics of Reactor Fuel Process Wastes. J. O. Blomeke, E. D. Arnold, and A. T. Gresky. (1958).
60. Water Supply and Drainage Quantities for Radioactivity Laboratories. John M. Ruddy. BNL-3283. (July 9, 1957).
61. Origin and Nature of Reactor Fuel Process Wastes. L. Hemphill, W. J. Boegly, Jr., and R. J. Morton.
62. Physical Characterization of Acidic and Neutralized Synthetic Fuel Reprocessing Waste Solutions on Evaporation and Calcination. F. M. Empson and I. R. Higgins. ORNL-2566. (February 17, 1959).
63. Waste Characteristics for the Resin-In-Pulp Uranium Extraction Process. E. C. Sivoglou, D. C. Kalda, and J. R. Dearwater. A/CONF.15/P/2359.
64. Recovery of Uranium from Highly Irradiated Reactor Fuel by a Fused Salt-Fluoride Volatility Process. G. I. Cathers, W. H. Carr, R. B. Lindauer, R. P. Milford, and M. E. Whatley. A/CONF.15/P/535.

65. A Preliminary Study of Pre-solvent Extraction Treatment of Stainless Steel - Uranium Fuels with Dilute Aqua Regia. F. G. Kitts and J. J. Perona. CF-57-6-125(Rev.) (October 11, 1957).
66. Manual for the Preparation of Simulated Fuel Reprocessing Waste Solution. W. J. Lacy. CF-58-4-45. (June 20, 1958).
67. Development of the Sulfex Process for Decladding Stainless-Steel-Clad Power Reactor Fuel Elements with Sulfuric Acid. J. R. Flanary, W. E. Clark, J. H. Goode, and A. H. Kibbey. ORNL-2461. (March 30, 1959).
68. Recovery of Enriched Uranium from Uranium Dioxide-Stainless Steel Fuel Elements by Solvent Extraction. J. R. Flanary and J. H. Goode. Ind. Eng. Chem. 51, 23-6 (January 1959).
69. Dissolution and Feed Preparation for Aqueous Radiochemical Separation Processes. F. L. Culler and R. E. Blanco. A/CONF/15/P/1930.
70. Aqueous Decontamination of Plutonium from Fission Product Elements. R. S. Winchester and W. J. Maraman. A/CONF.15/P/530.
71. Composition of Solids from Purex IWW. H. H. Van Tuyl. HW-58970. (January 22, 1959).
- 4.20 Treatment for Disposal
 72. Removal of Fission Products from High Level Radioactive Waste Solutions. R. E. Blanco and J. T. Roberts. CF-59-1-32. (March 30, 1959).
- 4.21 Evaporation
 73. Description of the Decontamination Room Waste Evaporation Unit. WAPD-PWR-PMF-311. (May 1956).
 74. Final Report on E. I. du Pont de Nemours Radioactive Waste Concentration Project. Theodore C. Carnavos. AECU-3791. (October 15, 1956).
- 4.22 Calcination
 75. Calculational Models of Pot Calcination. M. E. Whatley and J. J. Perona. CF-59-3-56. (March 23, 1959).
 76. "Conversion of Liquid Wastes to Solids." Nuclear Energy Engr. 12, 430-3 (1958) Dec.
 77. Calcination of High Level Atomic Wastes as a Step in Ultimate Disposal. R. F. Domish, E. J. Tuthill, and L. P. Hatch. BNL-535.
 78. Reduction of Radioactive Waste to Solids for Ultimate Storage. C. W. Hancher. CF-59-1-77. (January 28, 1959).
 79. Fluidized-Bed Conversion of Fuel Processing Wastes to Solids for Disposal. J. W. Loeding, A. A. Jonke, W. A. Rodger, R. P. Larsen, S. Lawroski, E. S. Grimmett, J. I. Stevens, and C. E. Stevenson. A/CONF.15/P/1922.

80. Heat Transfer in Radiant-Heat Spray Calcination. B. M. Johnson, Jr. HW-58641. (February 1, 1959).
81. Leaching of Fission Products from Calcined Process Waste. M. E. McLain and D. W. Rhodes. IDO-14440. (April 30, 1958).
82. Attrition Test on Calcined Idaho Chemical Processing Plant Waste. P. N. Kelly. IDO-14446. (December 1, 1958).
83. Study of Corrosion on Various Metals in the Calcining of Aqueous Radioactive Wastes Containing Zirconium Fluoride and Aluminum Nitrate As Bulk Salts. E. J. Tuthill and R. F. Domish. BNL-510. (May 1958).

4.23 Fixation

84. The Behavior of Ruthenium in the Fixation of Fission Products. Presented at Nuclear Engineering and Science Conference, held at Chicago, March 17 to 21, 1958. Preprint 67, Session 16. W. E. Erlebach and R. W. Durham.
85. Some Fundamental Problems in Fixation of Radioisotopes in Solids. H. C. Thomas. A/CONF.15/P/2441.
86. Essais D'incorporation de Solutions Concentrees de Produits de Fission Dans Des Verres Et Des Micas. (Experiments on the Incorporation of Concentrated Solutions of Fission Products in Glasses and Micas.) R. Bonniaud, P. Cohen, and C. Sombret. A/CONF.15/P/1176.
87. Disposal of Fission Products in Glass. L. C. Watson, R. W. Durham, W. E. Erlebach. A/CONF.15/P/195.
88. The Fixation of Highly Active Wastes in Solid Form. C. B. Amphlett. "Progress in Nuclear Energy. Series III. Process Chemistry. Volume 2."
89. "Disposal of Long-lived Fission Products." J. R. Grover. J. Brit. Nuclear Energy Conf. 3, 80-5(1958) Jan.
90. "Ceramic Sponges for Radioactive Waste Disposal." C. W. Christenson. J. Am. Water Works Assoc. 51, 388 (1959) March.
91. Summary of Summer Work on the Incorporation of Radioactive Isotopes in Ceramic Masses. G. C. Robinson. CF-58-4-74. (April 16, 1958).
92. Retention of Fission Products in Ceramic Glaze-Type Fusions. M. I. Goldman, J. A. Servizi, R. S. Daniels, T. H. Y. Tebbutt, R. T. Burns, and R. A. Lauderdale. A/CONF.15/P/388.

4.24 Precipitation and Scavenging - Co-precipitation and Co-crystallization

93. Fission Product Recovery from Radioactive Effluents. R. L. Moore and R. E. Burns. A/CONF.15/P/1768.
94. The Treatment of Large Volume, Low Level Waste by the Lime-Soda Softening Process. K. E. Cowser, R. J. Morton, and E. J. Witkowski. A/CONF.15/P/2354.

95. Development of a Self-contained Scheme for Low Activity Wastes. R. H. Burns and E. Glueckauf. A/CONF.15/P/308.
96. The Removal of Cesium-137 and Strontium-90 from Scavenged Bismuth Phosphate Solutions. J. R. McHenry. HW-48141. (February 7, 1957).
97. Treatment of Radioactive Effluents at the Mol Laboratories. P. Dejonghe, L. Baetsle, and G. Mosselmans. A/CONF.15/P/1676.
- 4.25 Electrolytic and Ion Exchange
98. Proposal for Installation of Equipment for Treatment of ORNL High Level Waste. I. R. Higgins. CF-57-10-129. (October 24, 1957).
99. An Electrolytic Procedure for the Removal of Ruthenium and Nitrate from Alkaline Waste Solutions. A. F. Messing and I. R. Higgins. ORNL-2532. (September 19, 1958).
100. Treatment of Radioactive Wastes Using Ion Transfer Membranes: Removal of Bulk Electrolytes. Presented at Nuclear Engineering and Science Conference, held at Chicago, March 17 to 21, 1958. Preprint 55, Session 16. E. A. Mason, E. J. Parsi, and A. J. Giuffrida.
101. Ion Exchange Removal of Fission Products from High Purity Water: Development Work Associated with the PWR Radioactive Waste Disposal System. W. T. Lindsay, Jr. and C. S. Abrams. WAPD-PWR-CP-2636. (1957).
102. Optimum Conditions for the Use of Vermiculite in the Decontamination of Radioactive Effluent. T. D. Wright and J. Monahan. AERE-E/R-2707. (October 1958).
103. Decontamination of Low Saline and Low Active Effluents of Radiochemical Industries. S. A. Voznesenskii(Voznesensky), G. A. Sereda, P. F. Dolgikh, and L. I. Baskov (U.S.S.R.). A/CONF.15/P/2024.
It features coagulation and ion exchange resin sorption.
104. "Ion Exchange" Robert Kunin and George W. Bodamer. Ind. Eng. Chem. 51, 373-7(1959) Mar.
105. Development of a Continuous Ion Exchange Process for the Removal and Recovery of High Purity Cesium from Alkaline Waste. I. R. Higgins and A. F. Messing. ORNL-2491. (November 6, 1958).
106. "Synthetic Inorganic Ion Exchange Materials. II. Hydrous Zirconium Oxide and Other Oxides." C. B. Amphlett, L. A. McDonald, and M. J. Redman. J. Inorg. and Nuclear Chem. 6, 236-45 (1958) June.
107. "Equilibrium Studies on Natural Ion Exchange Minerals. II. Caesium, Sodium and Ammonium Ions." C. B. Amphlett and L. A. McDonald. J. Inorg. and Nuclear Chem. 6, 145-52 (1958) April.

4.26

108. Elimination of Traces of Radioactive Elements from Aqueous Solutions. I. Formation of Silica Gel in Solutions Containing Traces of Radioelements as a Means for the Elimination of Activity in Radioactive Effluents. M. Milone, G. Cetini, and F. Ricca. A/CONF.15/P/1515. II. The Use of Basic Silica Gel for the Elimination of Radioelements in Aqueous Solutions. G. Cetini and F. Ricca.
109. Treatment of Radioactive Effluents with Sawdust or Brown Coal. P. Dejonghe, N. Van de Voorde, and M. D'hont. BLG-13. (December 4, 1957).
110. Waste Disposal Treatment of PWR Hot Laundry and Decontamination Room Wastes. Paul Cohen. March 23, 1956. Appendix I: Survey of Application of Standard Water Clarification Procedures to PWR Laundry and Decontamination Room Wastes; R. Lloyd. (WAPD-PWR-CP-1912). Appendix II: Conference Between R. Lloyd and J. R. LaPointe to Establish Tentative Procedures and Determine Equipment for Applying Adsorption-Flocculation Treatment to PWR Laundry Waste. R. Lloyd and J. R. LaPointe. (WAPD-PWR-CP-1929). Appendix III: Evaporation of Decontamination Room Wastes. C. S. Abrams. (WAPD-PWR-CP-1930). (WAPD-PWR-CP-1945) (WAPD-PWR-CP-1912)(WAPD-PWR-CP-1929) and (WAPD-PWR-CP-1930). WAPD-PWR-CP-1945.
This report and three appendices were issued separately, but are catalogued as a unit.
111. The Removal of Strontium from Wastes by a Calcite. L. L. Ames, Jr., J. R. McHenry and J. F. Honstead. A/CONF.15/P/395.
112. Flocculation-Adsorption Waste Disposal Treatment Investigation for Hot Laundry and Decontamination Room Wastes. R. Lloyd and W. T. Lindsay, Jr. WAPD-BT-11 (p.53-62).
113. Treatment of Ammonium Nitrate Solutions. T. W. Boyer, J. G. MacHutchin, and L. Yaffe. (June 10, 1958). U. S. Patent 2,838,368.
The treatment of waste solutions obtained in the processing of neutron-irradiated uranium containing fission products and ammonium nitrate is described.
114. The Pilot Plant Denitration of Purex Wastes with Formaldehyde. T. F. Evans. HW-58587. (February 23, 1959).
115. "Process for the Destruction of Radioactive Residues." Nuclear Power 3, 622 (1958). (October 1958).
To overcome the problem of disposal of radioactive fission products, this patent suggests exposing them to radiation to convert them into stable or short-lived isotopes.
116. Pilot Plant for Decontamination of Laboratory Liquid Wastes. K. A. Bolshakov, A. T. Avdonin, V. T. Borchev, F. V. Rauzen, et al. A/CONF.15/P/2025.
117. "Some Experiments on the Decontamination of Liquid Waste Containing Radioactive Strontium. Chemical Treatment with a Laboratory Scale Plant." E. Cerrai, A. Scaroni, and C. Triulzi (CISE, Milan). Energia nucleare (Milan 6, 207-17 (1959 March).

4.30 Treatment Processes for Recovery of Constituents

4.31 Fission Products

118. The Production of Kilocurie Sources of Caesium-137. B. F. Warner pp. 487-500 in "Progress in Nuclear Energy. Series III. Process Chemistry. Vol. 2.
119. "Study on the Separation of Fission Products. Preparation of Radioactive Carrier - Free Cesium." T. Siokawa and M. Yagi. Bunseki Kagaku 5, 220-1 (1956). CEA-tr-X67.
120. Separation of Americium and Promethium. R. S. Pressly. ORNL-2202, (March 27, 1957).
121. Fission Product Pilot Plant and Other Developments in the Radioisotope Program at the Oak Ridge National Laboratory. E. Lamb, H. E. Seagren, and E. E. Beauchamp. A/CONF.15/P/831

4.32 Uranium

122. "Wastes Yield Enriched Uranium. Goodyear Atomic Recovers Valuable U-235 and U-238 from Decontamination and Lab Waste Solutions." B. W. Penland. Chem. Eng. News 36, 50, 52(1958) Apr. 14.
123. Uranium Purification by Uranyl Ammonium Phosphate Precipitation. D. M. Lang. pp. 387-95 in "Progress in Nuclear Energy. Series III. Process Chemistry. Volume 2."
124. The Recovery of Uranium from Leach Liquors by Electrolytic Permselective Membrane Processes. R. Kunin. pp. 35-44 "Progress in Nuclear Energy. Series III. Process Chemistry. Volume 2."
125. The Chemistry and Metallurgy of Neptunium. H. A. C. McKay and M. B. Waldron, and J. S. Nairn. A/CONF.15/P/304.
Gram quantities of Neptunium were isolated from process wastes.

5.00 WASTE DISPOSAL

5.10 Tank Storage

126. Leak Detection -- Underground Storage Tanks. W. A. Haney. HW-51026. (June 20, 1957).
127. Corrosion of Type 316 Elc Stainless Steel in Fluoride-Bearing Zirconium Process Wastes. E. L. Hoffman and C. M. Slansky. IDO-14449. (January 9, 1959).
128. Instability of Steel Bottoms in Waste Storage Tanks. L. E. Brownell. HW-5727. (August 29, 1958).
129. Some Calculations on the Shields Necessary for Different Sizes of Effluent Tanks. J. H. Tait and J. Price. AERE-T/M-49. (June 6, 1951).

130. "Remarks on Heat Problems in the Long Term Storage of High Level Radioactive Liquid Wastes." M. Weber. Jaderna Energie 4, No. 2, 39-42(1958).
131. The Storage of High Level Radioactive Wastes. Design and Operating Experience in the United States. O. H. Pilkey, A. M. Platt, and C. A. Rohrmann. A/CONF.15/P/389.
- 5.20 Surface Disposal
132. "Uptake of Waste Sr-90 and Cs-137 by Soil and Vegetation." E. R. Graham. Soil Sci. 86, No. 2 91-7(1958).
133. The Adsorption of Radioactive Substances on Waterborne and Consolidated Materials. Presented at Nuclear Engineering and Science Conference, held at Chicago, March 17 to 21, 1958. Preprint 11, Session 35. F. B. Barker. (1958).
134. Chemical Investigations of the Movement of Fission Products in Soil. E. J. Evans. (AECL-667). CRER-792. (August 1958).
135. Recommended Limit for Radioactive Liquid Disposal from Hanford Separations Plants to Surface Ponds. H. V. Clukey. HW-41440. (February 16, 1956).
136. Experience in the Disposal of Radioactive Wastes to the Ground. R. E. Brown, D. W. Pearce, W. de Laguna, E. G. Struxness, H. Horton, Jr., and C. M. Patterson. A/CONF.15/P/1767.
137. Soil Disposal of Radioactive Wastes at ORNL: Criteria and Techniques of Site Selection and Monitoring. K. E. Cowser and F. L. Parker. Health Phys. 1, 152-63 (1958).
138. The Effect of Ground-Water Mounds on the Purex Operation. W. H. Bierschenk. HW-49728. (April 18, 1957).
A review of the changes in the size and shape of the ground-water mounds consequent upon disposal of cooling water from both the former B Plant operation and the present Purex operation is reported.
139. "Desert Basins and Waste Disposal." Wallace de Laguna. Health Physics 1, 195-200(1958).
140. Disposal of High Level Radioactive Liquid Wastes in Terrestrial Pits - A Sequel. W. de Laguna, K. E. Cowser, and F. L. Parker. A/CONF.15/P/2351.
141. Adsorption Characteristics of Long Soil Columns. J. R. McHenry. HW-40990. (May 1, 1955) Decl. June 11, 1958.
142. Applied Health Physics Annual Report for January - December 1957. CF-57-12-146.
Data are included on activity discharged to waste settling basins, laundry decontamination measurements, and bio-assay doses.
143. "Radioactive Contamination of Land Spaces by Insects Flying out from Contaminated Basins." A. A. Peredelsku and I. O. Bogatyrev. Izvest. Akad. Nauk S.S.S.R., Ser. Biol. No. 2, 186-92(1959)Mar-Apr.

144. An Evaluation of Asphalt and Other Materials for Lining Radiochemical Waste Storage Basins. A. J. Hoiberg, C. D. Watson, and G. A. West. ORNL-2508. (September 10, 1958).
145. Geology and Hydrology for Disposal of Radioactive Wastes to Ground at the Savannah River Plant. S. O. Reichert. DP-341. (December 1958).
146. Operational Experience in Hanford Liquid Waste Disposal. D. W. Rhodes, J. R. Raymond, and H. V. Clukey. p.5-22 (of) Sanitary Engineering Aspects of the Atomic Energy Industry. A Seminar Sponsored by the AEC and the Public Health Service Held at the Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio, December 6-9, 1955. TID-7517(pt. II)(Del.)(p.5-22).
The operational experience with ground disposal of low level radioactive liquid wastes at Hanford has been generally favorable over a period of approximately 10 years.
147. Evaluation of Sites for the Disposal of Radioactive Waste Solutions. J. R. McHenry and J. F. Honstead. HW-53219. (November 15, 1957).
148. "Soil Adsorption of Radioactive Wastes at Los Alamos." C. W. Christenson, E. B. Fowler, G. L. Johnson, E. H. Rex, and F. A. Virgil. Sewage and Ind. Wastes 30, 1478-89(1958) Dec.
149. A Study of the Migration of Radioelements in Soils. V. I. Spitsyn, V. D. Balukova, A. F. Naumova, et al. A/CONF.15/P/2207.
150. The Influence of Limestone Neutralization on the Soil Uptake of Sr-90 from a Radioactive Waste. H. L. Brandt and A. E. Reisenauer. HW-56582. (August 1958).
151. Research and Development Activities in the Field of Radiological Sciences Quarterly Progress Report (for) October-December, 1957. J. W. Healy, ed. HW-54938. (February 12, 1958) (Decl. May 12, 1958).
Studies on ground waste disposal, the gelling of liquid wastes, and the flow of ground waters in the area are described.
152. Research and Development Activities in the Field of Radiological Sciences. Quarterly Progress Report for January-March 1958. J. W. Healy, ed. HW-55586. (April 3, 1958) (Decl. October 13, 1958).
Studies of the geology, hydrology, and soil characteristics of the region were continued with refinement of the techniques involved so that the parameters involved in ground waste disposal can be better defined.
153. "The Migration of Radioactive Substances from an Open Water Reservoir." D. I. Il'in, A. I. Petrova, and N. Ya, Chepkasova. Atomnaya Energ. 5, 75-7(1958).
154. "Adsorption of Plutonium by Soil." D. W. Rhodes. Soil Sci. 84, 465-71 (1957) Dec.
155. "The Soil Ecosystem and Radioactive Waste Disposal to the Ground." S. I. Auerbach. Ecology 39, 522-9(1958) July.

156. "Ground Disposal of Radioactive Wastes." C. B. Amphlett. Atomics and Nuclear Energy 9, 194-7(1958) June.
157. "Adsorption of Radioactive Wastes by Savannah River Plant Soil." W. E. Prout. Soil Sci. 86, 13-17(1958) July.
158. "Ground Disposal of Radioactive Wastes." C. B. Amphlett. Atomics and Nuclear Energy 9, 242-4(1958) July.
159. Geologic and Hydrologic Guides to the Ground Containment and Control of Wastes at Hanford. Presented at Nuclear Engineering and Science Conference, held at Chicago, March 17 to 21, 1958. Preprint 14, Session 16. R. E. Brown and W. H. Bierschenk. 1958.
160. Calculation of Purex A-8 Crib Capacity. H. L. Brandt. HW-51399. (July 9, 1957).
- 5.30 Subterranean Disposal
161. Thermal Considerations in Deep Disposal of Radioactive Waste. F. Birch. NAS-NRC/Pub-588. (July 1958)
162. Feasibility of Establishing a National Burial Ground for Radioactive Waste in the Northeastern United States. J. M. Morgan, Jr. AECU-4102. (July 15, 1956).
163. A Field Test of the Movement of Radioactive Cations through an Underground Formation. Presented at Nuclear Engineering and Science Conference, held at Chicago, March 17 to 21, 1958. Preprint 64, Session 35. Ben B. Ewing. 1958.
164. Status Report on Waste Disposal in Natural Salt Formations: II. F. L. Parker, W. J. Boegly, Jr., R. L. Bradshaw, J. Crowell, E. R. Eastwood, F. M. Empson, B. D. Gunter, L. Hemphill, O. H. Myers, and E. G. Struxness. ORNL-2700. (April 23, 1959).
165. Methods of Storage of Solids Containing Fission Products. L. C. Watson, H. K. Rae, R. W. Durham, E. J. Evans, and D. H. Charlesworth. CRCE-736. (June 1958).
166. The Disposal of Power Reactor Waste into Deep Wells. W. de Laguna and J. O. Blomeke. CF-57-6-23. (June 13, 1957).
167. Status Report on Waste Disposal in Natural Salt Formations. F. L. Parker, L. Hemphill, and J. Crowell. ORNL-2560. (Sept. 2, 1958).
168. Initiation of a Field Burial Test of the Disposal of Fission Products Incorporated into Glass. A. R. Bancroft and J. D. Gamble. CRCE-808. (November 1958).
- 5.40 Rivers
169. "Dispersion of Radioactive Materials by Streams." J. J. Davis. J. Am Water Works Assoc. 50, No. 11, 1505-15(1958) Nov.

170. Flow Patterns in Disposal to the Columbia River. J. W. Healy, J. F. Honstead, and W. Y. Matsumoto. p.23-36 (of) Sanitary Engineering Aspects of the Atomic Energy Industry. A Seminar Sponsored by the AEC and the Public Health Service Held at the Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio, December 6-9, 1955. TID-7517(Pt. II)(Del.)(p-23-36).
171. Disposal of the Radioactive Effluents at the "Commissariat a l'Energie Atomique." Treatment Leading to Evacuation into a River. Duhamel, Menoux, and Candillon. A/CONF.15/P/1175.
172. Dispersion of Soluble Radioactive Material in Water. F. S. Dunning and John C. LeDoux. CF-58-3-1C9. (March 20, 1958).
173. Effects of Direct Disposal of Reactor Effluent Water to the River. R. B. Hall, W. N. Koop, and J. D. McCormack. HW-55249. (March 6, 1958).
174. Dilution of 300 Area Uranium Wastes Entering the Columbia River. W. A. Haney. HW-52401. (September 9, 1957).
175. "Effect of Uranium Ore Refinery Wastes on Receiving Waters." E. C. Tsivoglou. Sewage and Ind. Wastes 30, 1012-27(1958).
176. Radiological Development Activities in the Health Physics Unit. Semiannual Progress Report for January-June 1955. J. H. Cherubin and J. J. Fitzgerald. KAPL-1409.
Radiobiological monitoring of the Mohawk River was initiated to evaluate the effects of disposal of radioactive liquid waste into that stream.
177. The Hanford Atomic Project and Columbia River Pollution. H. V. Clukey. HW-54243(Rev.). (December 20, 1957).
178. Model Study of the Fate of Pollution in a Tidal Estuary. P. J. Huiswaard and Carlos G. Bell, Jr. Jan. 29, 1957 Project title: The Fate of Fission Products in Surface Waters. AECU-3966.
179. "Radioactive Waste Disposal in the Abyssal Depth of the Ocean." V. G. Bogorov and E. M. Kreps. Priroda No. 9, 45-50(1958) Sept.
180. Chemical Stream Pollution from Uranium Mills. A. Whitman and E. S. Porter. WIN-99. (June 13, 1958).
181. "The Travel Time of Radioactive Wastes in Natural Waters." G. T. Bryant and J. C. Geyer. Trans. Am. Geophys. Union 39, 440-5(1958) June.
182. Applied Health Physics Semi-Annual Report (for) July 1956 - December 1956. CF-57-1-173.
Data are included from a survey of natural radioactive elements in TVA lake waters, activity levels in samples of river and lake waters in the laboratory drainage area, rain water, and laundry decontamination measurements.

5.50 Oceans

183. The Disposal of Radioactive Waste Materials at the University of California Radiation Laboratory. J. A. Kaufmann and N. B. Garden. UCRL-8380. (June 1958).
184. Oceanic Research Needed for Safe Disposal of Radioactive Wastes at Sea. R. Revelle and M. B. Schaefer. A/CONF.15/P/2431.
185. Oceanographical Researches on the Waste Disposal Off the Coast of Tokai-Mura. A/CONF.15/P/1355.
186. Disposal of Radioactive Liquid Wastes Coastal Waters. H. J. Dunster. A/CONF. 15/P/297.
Disposal data obtained during five years of experimental release of dilute liquid waste from Windscale Works into the Irish Sea are reviewed.
187. A Study of Some Factors Involved in the Disposal of Radioactive Wastes at Sea. Annual Progress Report. R. G. Bader. ORO-185. (February 1957).
188. "Effect of High Intensity Radiation on Electronic Parts and Materials." C. P. Lascaro and A. L. Long. Elec. Mf. 119-21, 306(1958) Sept.
189. Biological Investigations in the Water-Recipient at Studsvik, the Research Establishment of the Swedish Atomic Energy Company. P.-O. Agnedal, N.-E. Barrington. J. S. Lindhe, and J. W. Smith. A/CONF.15/P/174.
190. Sea Disposal of Low Activity Effluent. P. Bowles, R. H. Burns, F. Hudswell, and R. T. P. Whipple. A/CONF.15/P/296.
191. Concerning the Possibility of Disposing of Radioactive Waste in Ocean Trenches. V. G. Bogorov and E. M. Kreps. A/CONF.15/P/2058.
192. Reactor Fuel Processing. Technical Progress Review, Vol. 1, No. 4. Lemont Argonne National Laboratory, 1958.
An examination of British disposal of activity to the sea is reported.
193. Waste Processing: Windscale Philosophy and Arrangements. K. Saddington. pp. 456-69 in "Progress in Nuclear Energy.. Series III. Process Chemistry. Volume 2."
194. "Storage of Atomic Wastes in Glacial Caps of the Earth." B. Philberth. Compt. rend. 248. 2090-2(1959) Apr. 6.
195. Exercise Mermaid. P. Bowles, R. H. Burns, F. Hudswell, and R. T. P. Whipple. AERE-E/R-2625. (August 1958).
The exercise was performed because of the proposal to discharge radioactive liquid wastes to the sea.
196. Is It Permissible that Atomic Industry Waste be Dumped into the Black Sea? V. A. vodianitskii. Priroda 2, 46-52(1958). AEC-tr-3296.

197. Biological Factors Determining the Distribution of Radioisotopes in the Sea. B. H. Ketchum and V. T. Bowen. A/CONF.15/P/402.
198. "Nuclear Energy Developments and Oceanography." Nature 181, 1685-6(1958) June 21. Problems associated with the disposal of radioactive waste by discharge into the sea are discussed. Present research and regulatory activities throughout the world are summarized.
199. Factors Affecting the Dissipation of Windscale Radioactive Effluent in the Irish Sea. A. E. Shaw and F. R. Charlesworth. CF-8021. (February 20, 1952).
200. Absorption of Cesium-137 by Components of An Aquatic Community. R. C. Pendleton and W. C. Hanson. A/CONF.15/P/392.
- 5.60 Incineration
201. "Problems in the Incineration of Radioactive Waste." H. S. Jordan. Proc. Health Phys. Soc. 152-8(1957).
202. Incineration of Combustible Wastes Using Tangential Overfire Air. L. A. Spano and R. C. Corey. WASH-170(Del.)(p.281-304).
203. The Argonne Incinerator Program. W. A. Rodger and D. C. Hampson. WASH-170 (Del.)(p.58-62).
204. The Los Alamos Incinerator Program. H. F. Schulte. WASH-170(Del.)(p.11-12)

6.00 GASEOUS WASTES

205. Treatment of Radioactive Waste Gases. A. G. Blasewitz and W. C. Schmidt. A/CONF.15/P/397.
206. Waste Processing Studies Monthly Progress Report for March 1958. M. Steinberg. BNL-3867. (April 9, 1958). Studies of Kr and Xe sorption in various media are reported.
207. Waste Processing Studies Monthly Progress Report for April 1958. M. Steinberg. BNL-3868. (May 7, 1958).
208. Waste Processing Studies Monthly Progress Report for May 1958. M. Steinberg. BNL-3876. (June 10, 1958).
209. Waste Processing Studies Monthly Progress Report for June 1958. M. Steinberg. BNL-3877. (July 2, 1958).
210. Waste Processing Studies Monthly Progress Report for July 1958. M. Steinberg. BNL-3878. (July 30, 1958).
211. The Recovery of Radio Krypton from Dissolver Waste Gases by Fractional Extraction in Solvents. R. W. McIlroy, E. Glueckauf, H. J. de Nordwall, and F. C. W. Pummery. A/CONF.15/P/309.

212. "Aerosol Penetration Through Sand." R. E. Yoder. Proc. Health Phys. Soc. 165-76(1957).
213. "Disposal of Gaseous Effluents from Nuclear Power Plants." B. H. Hamling and G. F. Jenkins. J. Air Pollution Control Assoc. 7, 256-61(1958) Feb.
214. The Removal of Iodine from Gas Streams by Reaction with Silver in Packed Towers. R. McNabney and A. M. Lyon. ARSC-28(Del.) (August 26, 1949). Decl. with deletions March 24, 1959.
215. "The Dispersion of Stack Gases in Stable Atmospheres." Glenn R. Hilst. J. Air Pollution Control Assoc. 7, 205-10(1957) Nov.
216. Radiological Physics Division Semiannual Report for July through December 1957. ANL-5829. (February 1958). Wind tunnel studies on dispersal patterns of stack gases and application of a meteorological model towing tank for studies of turbulent diffusion in the atmosphere are reported.
217. "The variation of Effluent Concentrations During Temperature Inversions." M. E. Smith, I. A. Singer, F. E. Bartlett, and L. Marcus. J. Air Pollution Control Assoc. 7, 194-7(1957) Nov.
218. "Instrument for the Measurement of the Air Contamination Caused by Very Fine Dust Containing Uranium, Insensitive to the Radioactivity of the Air." C. Cottini, E. Gatti, and A. Malvicini. Nuovo cimento (10) 9, Suppl. No. 2, 381-4(1958).
219. "Continuous Air Monitor for H³." J. Brinkerhoff, C. A. Ziegler, R. Bersin, and D. J. Chleck. Nucleonics 17, No. 2, 76, 78, 81(1959) Feb.
220. "Radioactive Pollutants." J. W. Thomas, J. G. Terrill, Jr., and R. A. Gilmore. Proc. Am. Soc. Civil Engrs. 85, No. SA 1, 75-85(1959) Jan.
221. "Air and Dust Filters for Industry." H. Murmann. Translated into French from Metall 11, 868-73(1957). CEA-tr-A478.
222. Some Observations on Air Sampling Techniques Used at the Nevada Proving Ground. C. P. Skillern. W. S. Johnson, and H. F. Schulte. IA-1685. (June 1954). Changed from OFFICIAL USE ONLY Oct. 5, 1956.
223. Calculations Relating the Atmospheric Diffusion of Radioactive Contamination from the Stack of a Reactor. T. A. Hoffmann and G. Nemeth. A/CONF.15/P/1715.
224. Air Clearing Studies. Progress Report for July 1, 1955 to June 30, 1956. R. Dennis. L. Silverman, Charles E. Billings. E. Kristal, D. M. Anderson, and P. Drinker. NYO-4809. (March 16, 1959).
225. Preliminary Studies of Scavenging Systems Related to Radioactive Fallout. J. D. Stockham. AECU-3880. (October 22, 1958).

- 226. A Meteorological Study of Potential Atmospheric Contamination from Multiple Nuclear Sites. D. H. Pack and C. R. Hosler. A/CONF.15/P/426.
- 227. "On the Diffusion of Dust and Gases from Chimney-Stacks." A. I. Denisov. Translated by M. I. Weinreich from Izvest. Akad. Nauk S.S.S.R., Ser. Geofiz., No. 6, 834-7(1957). SCL-T-188.
- 228. Design and Economic Study of Hot Off-Gas Storage System. C. S. Johnson and T. J. Carter. AECD-4269. (December 20, 1957). Decl. with deletions June 27, 1958.
- 229. Meteorological Factors in the Appraisal and Control of Acute Exposures to Stack Effluents. J. J. Fuquay. A/CONF.15/P/1834.
- 230. Investigation into the Composition of the Solids Found in the Smoke Released in the Calciothermic Process for the Manufacture of Uranium. A. Travesi, F. de la Cruz, and R. F. Cellini. A/CONF.15/P/1415.
- 231. Fifth Atomic Energy Commission Air Cleaning Conference Held at Harvard Air Cleaning Laboratory, Boston, June 24-27, 1957. TID-7551. Separate abstracts of each of the papers presented have been prepared.
- 232. Air Cleaning Activities at ANL. D. P. O'Neil. TID-7551(p.5-8):
- 233. Air Sampling in Relation to the Meteorological Program at BNL. R. M. Brown. TID-7551(p.8-16).
- 234. Two Gas Cleaning Problems at the Idaho Chemical Processing Plant Site. D. M. Paige, P. N. Kelly, and E. S. Grimmett. TID-7551(p.17-23).
- 235. Air Cleaning Activities at Brush Beryllium Company. Hal J. Shafer. TID-7551 (p.23-4).
- 236. Air Cleaning Activities of the Beryllium Corporation. A. Epstein. TID-7551 (p.24-6).
- 237. Air Cleaning Activity at Oak Ridge Gaseous Diffusion Plant. R. C. Smith TID-7551(p.26-8).
- 238. AEC Bettis Plant Air Cleaning Activities. P. R. Bolton and J. E. Ross. TID-7551(p.30-1).
- 239. Air Cleaning Operations at the Rocky Flats Plant. R. J. Walker. TID-7551 (p.28-9).
- 240. Air Cleaning Operations at KAPL. W. H. Truran. TID-7551(p.35-40).
- 241. Air Cleaning Operations at UCRL. M. D. Thaxter. TID-7551(p.91-2).
- 242. Air Cleaning Activities at GE-ANP Idaho Test Station. R. M. Chatters. TID-7551 (p.33-5).

243. Air Cleaning Experience at the Naval Reactor Facility. J. R. Horan. TID-7551 (p.32-3).
244. Air Cleaning Activities of Atomics International. A. A. Jarrett. TID-7551 (p.40).
245. Developments in High Efficiency Air Filtration. P. M. Engle. TID-7551(p.44-5)
246. Developments in the Manufacture of Absolute Filters. A. R. Allan. Jr. TID-7551(p.45-6).
247. Developments in the Manufacture of Ultra-Aire Space Filters. R. A. Bub. TID-7551(p.47-50)
248. Fire-Resistive Filter Progress at HAPO. Don J. Keigher. TID-7551(p.50-2)
249. Moisture and Burning Tests of Space Filters. J. H. Palmer. TID-7551(p.53-65).
250. Design and Calibration of an Improved Cascade Impactor for Size Analysis of Aerosols. R. I. Mitchell and J. M. Pilcher. TID-7551(p.67-84).
251. A Multibed Low Velocity Air Cleaner. R. E. Yoder and F. M. Empson. TID-7551 (p.84-91).
252. Study of the Fundamental Properties of Aerosols. H. F. Johnstone. TID-7551 (p.108).
253. Air Cleaning Studies at Harvard University. Leslie Silverman. TID-7551(p.109-13).
254. Further Investigations of the Continuous Slag Wool Filter. C. E. Billings, C. Karker, Jr., E. C. Hickey, L. H. Levenbaum, and L. Silverman. TID-7551 (p.114-19).
255. Slag Wool for Acid Gas and Mist Removal. C. Kurker, Jr., C. E. Billings, and Leslie Silverman. TID-7551(p.120-9).
256. Economic Survey of Air and Gas Cleaning Operations within the AEC. R. Dennis, C. E. Billings, and Leslie Silverman. TID-7551(P.92-7).
257. Air Cleaning Costs - A Study of Three Systems. H. S. Jordan. TID-7551(p.98-107).
258. Development of a "Triboelectrified" Fluidized Bed for Aerosol Filtration. D. M. Anderson and Leslie Silverman. TID-7551(p.140-59).
259. Agglomeration of Particulate Materials. E. C. Hickey, C. E. Billings, and Leslie Silverman. TID-7551(p.130-2).
260. Progress Report on Filtration of a Freshly Generated NaK Fume. E. Kristal, R. Dennis, and Leslie Silverman. TID-7551(p.133-9).

261. Application of Fire-Resistant Air Cleaning Filters at HAPO. F. E. Adley.
TID-7551(p.65-7).
262. Air Cleaning Activities and Associated Studies at Goodyear Atomic Corporation. Ben Kalmon. TID-7551(p.41-3).
263. Particulate Airborne Contamination at Start-up of the EBWR. J. J. Hartig and J. A. Pagliaro. TID-7551(p.1-4).
264. Third Atomic Energy Commission Air Cleaning Conference Held at Los Alamos Scientific Laboratory, September 21, 22, and 23, 1953. WASH-170 (del.)
265. Los Alamos Air Cleaning Activities. J. B. Graham. WASH-170(del.)(p.7-10).
266. Air Cleaning Activities at Argonne National Laboratory. D. P. O'Neil. WASH-170(Del.)(p.48-54).
267. Hanford Air Cleaning Operations. A. G Blasewitz. WASH-170(Del.)(p.40-7).
268. The Handling of Radioactive-Contaminated Air at Oak Ridge National Laboratory. W. G. Stockdale. WASH-170(Del.)(p.21-35).
269. Ventilation and Air Cleaning Facilities for Normal Uranium Fabrication. W. H. Baumann. WASH-170(Del.)(p.13-20).
270. Ventilation Activities and Programs at Argonne National Laboratory. R. W. Van Valzah. WASH-170(Del.)(p.55-7).
271. Air Cleaning Problems at NRTS. A. L. Biladeau. WASH-170(Del.)(p.63-7).
272. Tests of the Aerodyne Dust Collector. W. H. Smith. WASH-170(Del.)p.87-97).
273. Ventilation and Dust Control in Refining Uranium Ores and Concentrates. H. I. Miller, Jr. WASH-170(Del.)(p.79-86).
274. Brief Summary of Air Cleaning Program at Westinghouse Atomic Power Division, Pittsburgh, Pa. E. C. Barnes. WASH-170(Del.)(p.99-101).
275. Tower Observations of Atmospheric Dust at the National Reactor Testing Station. P. A. Humphrey, E. M. Wilkins, and D. M. Morgan. WASH-170(Del.)(p.102-17).
276. Air Cleaning Problems at the Savannah River Plant. J. R. Clark. WASH-170 (Del.)(p.155-60).
277. Brookhaven Air Cleaning Operations. Lee Gemmell. WASH-170(Del.)(p.142-5).
278. Air Handling Facilities at the Ames Laboratory. R. W. Fisher. WASH-170(Del.) (p.165-9).
279. Air Cleaning Program at the Livermore Research Laboratory. G. T. Saunders. WASH-170(Del.)(p.185-90).

280. Site and Contractor Activities and Programs, U. C. Radiation Laboratory. M. D. Thaxter. WASH-170(Del.)(p.170-84).
281. KAPL Air Cleaning Program. J. Cherubin and J. J. Fitzgerald. WASH-170(Del.)(p.118-41).
282. A Constant Volume Radiochemical Hood. G. T. Saunders. WASH-170(Del.)(p.222-6).
283. Filtration of Macroorganisms from Air by Glass Fiber Paper Filters. H. M. Decker, J. B. Harstad, F. J. Piper, and M. E. Wilson. WASH-170(Del.)(p.227-34).
284. Further Studies on Electrostatic Separation. A. T. Rossano, Jr. WASH-170(Del.)(p.235-50).
285. Air Cleaning - New Developments at U. S. Radiation Laboratory. M. D. Thaxter. WASH-170(Del.)(p.218-21).
286. Fibrous Aerosol Filters. C. E. Lappie. WASH-170(Del.)(p.205-17).
287. Meteorological Aspects of Air Cleaning. P. A. Humphrey and E. M. Wilkins. WASH-170(Del.)(p.191-204).
288. Turbulent Deposition and the Behavior of Deposits of Solid Particles. S. K. Friedlander. WASH-170(Del.)(p.351-5).
289. Survey of Air Sampling Media and Sampling. Methods Used at AEC Areas and by Others. W. J. Smith. WASH-170(Del.)(p.330-3).
290. Evaluation of the KAPL Separations Process Stack Effluent. J. J. Fitzgerald. WASH-170(Del.)(p.334-48).
291. Properties of Various Filtering Media for Atmospheric Dust Sampling. W. J. Smith and N. F. Surprenant. WASH-170(Del.)(p.305-29).
292. Cotton Aeorsol Filter Studies. Preliminary Report. R. D. Coleman. WASH-170(Del.)(p.272-80).
293. Performance Characteristics of the Model K Electro-Polar Filter. Preliminary Report. R. Dennis, C. E. Billings, and Leslie Silverman. WASH-170(Del.)(p.262-71).
294. Further Studies of Fabric Dust Collectors. C. E. Billings, R. Dennis, and Leslie Silverman. WASH-170(Del.)(p.251-61).
295. Collection of Aerosols by Fiber Mats. J. B. Wong. WASH-170(Del.)(p.356-65).
296. Filtration of Submicron Size Aerosols by Fibrous Media. C. Y. Chon. WASH-170(Del.)(p.366-73).
297. Influences of Electrostatic Forces on the Deposition of Aerosols. H. F. Kraemer. WASH-170(Del.)(p.374-83).
298. Operating Economics of Air Cleaning Equipment Utilizing the Reverse Jet Principle. W. B. Harris and M. G. Mason. WASH-170(Del.)(p.68-78).

7.00 WASTES FROM REACTOR OPERATION

299. "Purifying Radioactive Sewage of Nuclear Power Stations." P. Profos. Brennstoff-Wärme-Kraft 10, 228-9(1958) May.
300. Radioactive Liquid Waste Disposal from the Dresden Nuclear Power Station. Presented at Nuclear Engineering and Science Conference, held at Chicago, March 17 to 21, 1958. Preprint 102, Session 16. C. F. Falk. 1958.
301. Plutonium Recycle Test Reactor Liquid and Gaseous Waste Disposal. J. E. Hard and D. R. Koberg. HW-59298. (February 17, 1959).
302. Bettis Technical Review. Reactor Chemistry and Plant Materials. WAPD-BT-7. (March 1958).
Bench-scale experiments were run with simulated waste liquors which were treated in a small clay column. The clay will not remove, by exchange, all types of products and its use appears to be limited.
303. Summary Report of Reactor Safeguard Committee. WASH-3(Rev.) (March 31, 1950). Decl. March 18, 1957.
Waste storage facilities are briefly outlined.
304. "Radioactive Waste Discharges from Nuclear Reactors." J. G. Terrill, Jr. Sewage and Ind. Wastes 30, 270-82(1958) Mar.
305. The Origin and Disposal of Power Reactor Wastes. G. P. Dix, R. C. Groscup, and J. M. Leffler. MND-1235. (February 5, 1958).
306. The Power Plant for the First Nuclear Merchant Ship (N.S. Savannah). John W. Landis. TID-7563(Pt.11-32).
307. "Safety Problems in the BER and Their Solution." Wolfgang Jacobi. Atomwirtschaft 4, 105-8(1959) Mar.
308. Maritime Reactor Project Annual Progress Report for Period Ending November 30, 1958. ORNL-2657. (February 5, 1959).
In studies of hazards associated with the operation of the N.S. Savannah, estimates were made of the activity buildup to be expected in the primary cooling system, the coolant purification system, and the waste disposal system.
309. Analytical Requirements on the Lockheed Critical Experiment Reactor, of the Radiation Effects Reactor, and of the Radioactive-Waste Disposal System. J. H. Edgerton. TID-7568(Pt. 1)(p.50-74).
310. Considerations for the Design Criteria of the PWR Waste Disposal System. WAPD-PA-64. (December 14, 1954). Decl. October 24, 1958.
311. The Shippingport Pressurized Water Reactor. Reading Mass., Addison-Wesley Publishing Company, Inc., 1958.
312. Determination of Effective Neutron Flux for Production of Tritium from LiOH in PWR Primary Coolant. P. Frank. WAPD-PWR-TW-39. (February 1959).

313. PWR Radioactive Waste Disposal System, Activity Balance. WAPD-PWR-PMF-278
(issue 2) (July 16, 1956).
314. PWR Radioactive Waste Disposal Plant. WAPD-PWR-PMF-360.
315. "Shippingport Atomic Power Station, Radioactive Material Control." J. R.
Lapointe and R. D. Brown. Ind. Eng. Chem. 50, 980-6(1958) July.
316. Shippingport Atomic Power Station Manual. Volume I. Operation Guide (1958)
TID-7020(Vol. I).
317. Organic Reactor Waste Gas Analyzer. H. M. Gilrey and R. J. Edwards. NAA-SR-
2938. (October 15, 1958).
318. Experiments on the Release of Fission Products from Molten Reactor Fuels.
G. W. Parker and G. E. Creek. CF-57-6-87(Rev.) (March 11, 1958).
319. Fission and Corrosion Product Activities in Main Coolant and Atmosphere of
the Vapor Container. H. S. Kresny and P. B. Haga. YAEC-71. (May 15, 1958).
320. "Army Package Power Reactor Water Treatment and Waste Disposal." A. Louis
Medin. Ind. Eng. Chem. 50, 989-90(1958) July.
321. Sizing Criteria for Tanks and Pumps of a Radioactive Waste Disposal System.
J. M. Randman. WAPD-BT-9(p.9-15).
322. Decontamination of the KAPL 120 Loop by Alkaline Permanganate - Acid Treatments.
F. C. Steiner. KAPL-M-SMS-95.
323. The Effect of Ultrasonic Agitation on Surface Decontamination Rates. J. L.
Linsley-Hood. RDB(W)/TN-113. (December 1953).
324. Theory of Decontamination. Part I. C. F. Miller. USNRDL-460. (July 15,
1958).
325. Interim Report No. 2 on Internal Chemical Decontamination Through Reactor
Decontamination with Turco 4306-B. H. F. Jensen. HW-46001 A. (July 1, 1958).
326. Interim Report No. 3 on Internal Chemical Decontamination with Turco 4306-B.
C. J. DeBevec and T. D. Dow. HW-56001 B. (July 31, 1958).
327. Interim Report No. 4 on Internal Chemical Decontamination; Rear Face Process
Piping only with Turco 4306-B. H. F. Jensen. HW-56001 C. (July 31, 1958).
328. Chemical Decontamination of the Internal Surfaces of Reactor Coolant Systems.
C. M. Unruh. HW-54509. (March 31, 1958).

8.00 ECONOMICS AND TRANSPORTATION

329. Comparative Costs of Sea Disposal and Land Burial for the Radioactive Wastes of the Lawrence Radiation Laboratory. Elmer Nielsen. UCRL-8609. (January 21, 1959).
330. Handling Problems with Radioactive Materials. Frank Ring, Jr. 10p. in "Advances in Materials Handling." New York, The American Society of Mechanical Engineers, 1958.
331. "Interpretation of Regulations Governing the Shipment of Radioactive Material. C. W. Buckland, Jr. A.M.A. Arch. Ind. Health 19, 33-43(1959) Jan.

9.00 COMMERCIAL UTILIZATION

332. Radioisotopes in Scientific Research. Volume II. Research with Radioisotopes in Chemistry and Geology. Proceedings of the International Conference held in Paris in September 1957 under the Auspices of the United Nations Educational Scientific and Cultural Organization. R. C. Extermann, ed. New York, Pergamon Press, 1958.
333. Industrial Utilization of Radioisotopes in Japan, 1958. Tokyo, International Cooperation Administration, Japan Productivity Center, 1958.

10.00 PROGRESS REPORTS

334. Chemical Engineering Division Summary Report (for) July, August, September 1, 1958. ANL-5924. (December 1958).
Development of a fluidized bed waste exterior is reported.
335. Nuclear Engineering Department Progress Report (for) October 1 - December 31, 1957. BNL-491.
Liquid waste operations are summarized.
336. Research and Development Activities in the Field of Radiological Sciences. HW-57908. Quarterly Progress Report (for) July - September 1958.
Ground waste disposal studies are reported.
337. Health Physics Report for January - March 1958. KAPL-1951.
338. Radiological Development Activities in Health Physics. Semiannual Progress Report (for) January - June 1957. L. J. Cherubin and J. J. Fitzgerald. KAPL-1964.
339. Health Physics Report (for) April, May, June 1958. KAPL-1991.
340. Health Physics Division Annual Progress Report for Period Ending July 31, 1958. ORNL-2590. (November 10, 1958).

341. Idaho Chemical Processing Plant Technical Progress Report for January through March 1958. C. E. Stevenson. IDO-14443. (September 15, 1958).
Fluidized bed waste calciner development is reported.
342. Idaho Chemical Processing Plant Technical Progress Report for April through June, 1958. C. E. Stevenson. IDO-14453. (November 5, 1958).
Initial tests have commenced with a NaK-heated 100 liter/hour pilot plant aluminum nitrate calciner to continue process demonstration.
343. Idaho Chemical Processing Plant Technical Progress Report for July - September 1958. C. E. Stevenson. IDO-14457. (February 2, 1959).
Development of fluidized bed waste calcination process is reported. In studies of the fluid bed calcination process for aluminum nitrate wastes, it was determined that alumina from which some strontium and the bulk of the cesium had been leached by dilute nitric acid would yield very little additional fission products upon several months' additional contact with water.

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